

SPECIAL RESEARCH INTO
OPPORTUNITIES FOR FACTORY
EMPLOYMENT OF THE BLIND
IN MINNESOTA

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IN MINNESOTA

From the beginning of its work the State Division of Reeducation and Placement of Disabled Persons has devoted a considerable amount of attention to the problem of the blind. In so doing it came into contact with the private organizations dealing with the welfare of the blind in Minneapolis, St. Paul and Duluth and developed close relations with all three of them in arranging training courses and effecting placements.

On two occasions during 1921, in the spring and in the fall, state-wide conferences were held on the call of the Division at which the problems of the blind received special attention. The conference in the fall was more intensive and resulted in the formation of the State Council of Agencies for the Blind in order to foster and unify all the state and private welfare work of this nature. Prior to the organization of the State Council however, the Minneapolis society had approached the State Board of Education with a request that the Division of Re-education make a detailed study of factory occupations in order to determine which ones were feasible for the blind and further the placement of the blind in such work. In view of the efforts which were being made to further a forward movement for the blind in the state the Board decided to authorize such a study. Permission was also secured from the Federal Board for Vocational Education to apply federal funds to cover half of the expense.

In order to understand the aim of the study a glance at the economic condition of the blind and the nature of their occupations is necessary. Exact data as to the earnings of the blind and as to the occupations learned and followed by them after becoming blind are not available. The statistics of the United States census are weakened because of the inclusion of many occupations which were followed by blind persons before becoming blind. In some instances these can of course be continued afterward but it is not possible to consider them as practical occupations for a person to learn after he has become blind. Reliable estimates as to self-support also are difficult to find although it is probable that the percentage which is economically self-sufficient is not great. Of those who

have lost their sight before twenty and have received their education and industrial training largely in schools for the blind it is said by Dr. Best in his book, "The Blind" that over 50% are in the four occupations for which training is usually given, namely, music, broom making, piano tuning and weaving. Basketry and chair caning are two other traditional lines but the earning capacity of the workers is quite low as a rule. The tendency to use basketry as occupational therapy in tuberculosis sanatoria and hospitals for the insane as well as surgical hospitals has tended to flood the market with this product and almost eliminate basketry as a means of livelihood. Some of the blind have made good in professions, such as law, teaching, elocution and authorship, but it is obvious that these must be as exceptional among the blind as they are among the normal population. Others have been successful in managing small businesses but these have usually had the assistance of sighted members of the family and of course a certain amount of capital is necessary. Salesmanship, usually of the nature of house to house canvassing, is another line that has been successfully followed by the blind. Here again a certain amount of ability is a special requisite and the increasing hazard of the modern highway has made the line less desirable than it has been. Other lines in which courses have been given by the Division of Re-education in cooperation with local societies are massage, player piano repair and dictaphone work. Player piano repair is becoming an essential complement of piano tuning and is open to the same objection that it is a possibility only for those who have a musical ear, hence is not a solution of any considerable part of the economic problem of the blind. Both massage and dictaphone work are still on trial and it is doubtful whether they will absorb any considerable number of the blind.

At first thought it would seem that the development of the factory method of production would militate against the efforts of the blind to maintain themselves. In so far as factory products have entered the fields where the blind were producing goods they have rendered competition difficult. As factory production has tended to become more and more specialized, however, with minutely subdivided processes rendering little skill or general trade knowledge necessary it has come into a condition where it becomes feasible for blind workers. This has been noted in a number of places, such as Cleveland, Ohio, Grand Rapids, Michigan

and Ampere, New Jersey. Efforts were made to secure opportunities for blind workers in these new processes. These efforts, according to published reports, have been attended by a considerable degree of success. It was found that blind persons could perform some processes as well as sighted persons and could readily earn a living wage thereby. The most hopeful lines as reported by these cities were the manufacture of electrical appliances, including chiefly the winding of coils, and metal products factories where small assembling jobs could be found.

The plan followed in Minnesota was to hire a blind man who could serve as a demonstrator. For this purpose Mr. John Stackpole, a graduate of the State School for the Blind at Faribault and an employe at the time of the Victor Broom Shop in Minneapolis, was engaged. He proved to have an all-round ability in mechanics which was very useful in the experiment. The only possible drawback was the possibility that he did not represent an average or typical blind person. This, however, was offset by the consideration that at any rate as far as the blind were concerned, the experiment was being made under favorable conditions. Much preliminary work had to be done in order to bring the nature of the experiment to the attention of the employers of the three cities - Minneapolis, St. Paul and Duluth - and to emphasize the need of cooperation on their part. This was accomplished through the press, the platform and personal visitation. A classified list of industries and commercial plants was used and a selected list made. By the process of elimination those willing to help in the experiment were listed. The next step was to make a casual survey of the plants by one acquainted with industrial organization in order to note operations that might be adapted to the try-out by the blind worker, (usually more were listed than could be used), talking with the plant superintendent and the various foremen and enlisting their good will in carrying out this experiment.

During a considerable part of the experiment the cooperation of Mr. G.A. McGarvey, State Supervisor of Trade and Industrial Education, was secured in making these surveys. At other times the survey was made by the executive secretary of the local organization for the blind, or by Mr. Morse or Mr. O'Donnell, Assistant Director of the Division of Re-education and Placement Specialist of the Division of Re-education, respectively.

Much depended upon the attitude of the foremen of the shop and those under him. Even though the superintendent of the plant was perfectly willing that a blind person be placed there it was often found that the best results were obtained through a thorough understanding with the shop foremen. As a rule, employers were found on approach to fall into two opposing groups with respect to the experiment - those who had a very skeptical attitude, objecting on the ground that the product had to be carefully inspected or that the psychological effect of the blind worker in the plant would be bad, or those who took the over-optimistic attitude, expecting the blind to display a preternatural ability. The skeptical employer sometimes argued also that the blind man might be hurt in his establishment. To such an employer it was pointed out that if an injury occurred to the blind demonstrator, not the employer but the state would be liable for the compensation since it was paying the wage of this particular person. It was also pointed out with respect to any blind persons who might be hired as result of proof that any jobs were feasible, that the liability could be covered by insurance at precisely the same rate as a sighted employee since a special statute forbade any discrimination on the part of insurance companies based upon the handicapped condition of employees. In the main the experiment proved to be a selling proposition. Preliminary talks before groups of employers were helpful only as smoothing the way. Definite personal work with each employer, superintendent and foreman had to be done in any event. The proposal had to be presented in an attractive manner and the work done in other factories together with statements made by other factory superintendents had to be presented.

As soon as the entree was secured to the plant the usual course was to have the foreman ^{been} show the demonstrator the simplest operations that had/suggested from the list of possible try-outs. In some instances the demonstrator had to be assisted by another employee from time to time. Certain readjustments at times had to be made. The demonstrator kept a careful record of his time also of the skill acquired in order to serve as a guide to persons who in the future might be trained in these lines. The usual time in one department was from four to six days and in no instance did the time in the plant exceed two weeks.

The assistance of Mr. McGarvey was especially valuable in standardizing the form to be used in summarizing various jobs within a plant and for reporting and listing the work carried on by the blind demonstrator. The form covered such matters as name and location of the firm, the product, superintendent and foreman and department job, the names of operations with a parallel column telling what the worker needed to know, materials, operations, tools, and equipment, safety precautions, general information, training period, listing of processes and operations, adjustments that need to be made, conclusions and recommendations. The person who made the first contact and survey usually turned in such a form and the demonstrator filled out a similar one on completing his try-out. While the form was not rigidly adhered to throughout the duration of the study it was used in all of the intenser researches and was followed in substance at all times.

As a general estimate of the experiment it might be said that it proved that ninety processes in the factories of the three cities were feasible for blind persons. Not all of these processes are feasible to the same degree nor are all of them customarily organized as separate jobs. Sometimes the question of whether a particular process will constitute a job varies with the size of the factory, in other instances, the practice of the trade determines this.

It should be stated that the period during which the research was made - January to June 30, 1922 - was not a favorable one for such a study. Some of the factories which might have been studied were entirely closed down and many of the others were running at a diminished rate of production. At first it was thought that the slack economic condition might be favorable to the study since the employers would have more time to give attention to it, but it was soon found that the psychological effect of the depression on the employer quite offset the supposed advantage. In addition, there was the trouble that many machines were not in operation and many processes which were constituted as separate jobs during prosperous times were now being done by workers who changed from one part of the work to another during the day. Insofar as the requirement made of the worker approached all-round ability at any job in the factory the possibility for the employment of blind persons diminished. Insofar as the processes were subdivided and workers held to one process the chances for the availability of the blind increased.

Surveys without demonstrations were made in seventeen factories in St. Paul, thirty-two in Duluth and nine in Minneapolis. Surveys and demonstrations were made of three factories in St. Paul, eight in Duluth and twenty-three in Minneapolis. The slack economic condition was further reflected by the fact that only four placements of blind persons resulted from the study. Ordinarily a much larger number would have been expected and of course there is still the prospect that in the future placements can be made as a result of the information that was gained. The placements that were effected were: one man was machine operator in a light metal products factory (had previously been employed in packing department), one man at etching bulbs in an electric light bulb factory, one girl at wrapping and packing candy in a candy factory and one girl as flour mill employe engaged in folding flower sacks. The employe who was placed at etching bulbs subsequently gave up the work on the ground that he could not earn as much at that as he could in some other occupation. The occupation, however, would be feasible for a person with limited vision.

Before taking up the various processes which were found to be practicable reference should be made to a few of the disappointments or negative results. The most unexpected of these was in connection with armature winding. The description of the results secured in other cities had led those in charge of the experiment to believe that there were certainly possibilities in such a line. Arrangements were accordingly made with a large concern which deals in repairs of small automobiles. The attitude of the management was favorable and Mr. Stackpole was placed at work re-winding generator armatures after the old winding had been stripped. The particular armature in question is one of the simplest on the market and it has been considered about as cheap to scrap the burned out armature as to strip and re-wire. After the re-winding by the demonstrator, it was necessary for someone else to test the armatures for shorts and grounds, do the soldering, turndown, shellac and bake. A week's trial was given to the work. The re-winding of the first armature took nine hours while the tenth one was accomplished in four hours. It was figured that the period that had been spent covered what should be the ordinary training period. The finding of the foreman, however, was that the armatures re-wound by the demonstrator were not neat enough in appearance to be put on the market. It also appeared

that it would not be practical for a blind person to learn more than the simpler types of winding and in the repair shops men have to know at least twelve different types of re-winding; some of these are rather complex and require study. It was therefore decided that at least as regards the sort of armature winding that is carried on in Minnesota, it would not be a paying proposition for blind persons.

Another occupation which has frequently been urged as a possibility for blind persons is core making. A trial was given of this at an iron works in Duluth. The result was to show that the small plain cores were the only ones which were practical for blind persons and that except in establishments which made only one kind of product and confined the core making to the very simple forms this line was not a practical one.

Book binding is another occupation in which prospects for the employment of blind persons have been mentioned. It was impossible even to get the experiment tried in any of the book binding concerns of Minnesota which were approached. One establishment which had book binding and general publishing operations did, however, permit a survey and this developed the suggestion that four operations were feasible: drilling holes in catalogs for putting a string through, putting strings in catalogs, stacking catalogs and taking catalogs from binding machines. The manager, however, was so skeptical that the demonstration was not attempted.

In regard to other kinds of work the results were not so discouraging. The summary which the Division of Re-education has made of the study is classed under seventeen headings, according to the nature of the industry.

The first relates to small machine parts shops. In these there were found to be nineteen processes which can be performed by blind persons. As mentioned above, the extent to which they would be organized as separate jobs would depend upon the degree of activity of the given plant and the extent to which the work was customarily subdivided. The most favorable of the establishments of this class which were studied was a factory which produces a thermostat. Besides doing a considerable amount of

assembling the demonstrator proved that a power drill which reamed holes in motor parts could be operated with success, also that an arbor press (hand machine) which presses collars upon shafts could be operated and that riveting stubs into discs for contact springs, using a hammer, was entirely within the grasp of a blind person.

In the paper box factories five processes were found to be successfully performed by the demonstrator. All of these were very simple operations and in a period of industrial activity should offer a good wage to the blind. An illustration of the simplest operation involved which would constitute a separate job is that of bending boxes. The demonstrator took care of 900 of these in four and one-fourth hours. He reported that he could have done more but had been shown the slow way at the outset by the proprietor. The forelady showed him later the fast way and he increased his production. The job is one that is customarily held by a girl.

In the knitting works nine processes were successfully demonstrated. Five of these however were in the shipping department and therefore not entirely peculiar to these industries. The processes in the general factory offer opportunities for women while those in the shipping room would be available for men. The taping of garments and the forming of garments were the most hopeful in the factory itself. In the packing department the demonstrator not only did the setting up and nailing of wooden packing cases himself but trained another blind man so that he would be in line for a position whenever additional help was taken on.

The fourth group of industries in which opportunities were found was the automobile body building and repair line, including battery work. Some remarkable work was done by the demonstrator in taking down and setting up parts of automobile engines. But in practice hardly any of this work would be so organized that a blind man could engage in only one phase of it. The most hopeful opportunities in this group were found in the assembling plant of a large motor company which produces a small automobile, and consisted of putting nuts and gaskets on the gas line and in assembling top rests. One day was spent at these two processes with the result that he put nuts and gaskets

on eighty-nine gas lines and assembled forty-four pairs of top rests. Only the slack industrial conditions prevented a placement as result of this demonstration. In the battery work the demonstrator assembled thirty-eight groups with rubber and twenty-eight groups with wood separators in about an hour and fifteen minutes. He found the wood separators more feasible than the rubber and thought the operation practicable but could not equal the speed of a sighted person. In all, six processes were found in this group.

Another class of industries which offered opportunities was the novelty advertising companies. Four possibilities were found here including the one in the shipping department. The most promising process was that of cleaning glass in the framing department. This consisted of taking a package of glass running from thirty-eight to fifty, in boxes varying in size, and cleaning them with a cleaning preparation, and polishing the clean surface. At first thought, this would seem impossible but the demonstrator performed it successfully.

The sixth class of industries found to hold out promise was the electric light globe factories. Only one process was found feasible, that of etching bulbs. This is performed by blowing a fine marble dust through a metal stencil, the blast being regulated by a foot lever. A placement was made of another blind man shortly after the visit of the demonstrator to this factory. The workers are paid 3 $\frac{1}{4}$ ¢ per 1000. At first it was hoped that the blind man who took the job would work up to the production of a sighted person, but it was found in practice that he could not turn out much more than 7000 bulbs a day due to the fact that after being etched the bulbs had to be placed in a tray. Consequently the blind worker quit the job after a time in order to do work at which he could earn more money. The job would be much more practical for a person with a limited amount of vision. All that would be required would be enough vision to assist in placing the bulbs on the tray.

The seventh class consists of wooden box factories. Only two processes were feasible here and these would only be handled as separate jobs in large factories. The better of these two processes consists of stringing folding boxes

on wires. The present scale of wage is \$1.80 per 100 boxes. Experienced workers average 160 boxes per day, beginners 50. It is customary to pay the learner on the time basis for the first few weeks. The superintendent of the plant reported Stackpole's work very good, saying: "I think he could come up to 150 a day in time".

Three practical jobs were found in the paper and cloth bag factories. These jobs are customarily performed by women. The process of turning large cloth bags by hand, which is one of the best possibilities, is done in teams. The blind demonstrator worked with a blind partner, part of the time singly and part of the time in team and took care of in one day 2265 bags and another day 2800.

In the manufacturing of clocks and chimes, six processes were found to present opportunities, these chiefly in the nature of assembling and smoothing. The superintendent made this comment: "Stackpole's work proved many operations absolutely practical for a blind man to perform. He was very skillful and his speed equalled that of any sighted person in these particular operations."

The candy factories offered one of the most hopeful fields that was discovered. The only drawback is that the work is mostly for women while the need for employment opportunities for the blind exists mostly for men. Six processes were found to be very practicable and as mentioned above one placement was made. The only job in the group for a man is that of operating the feeding machine, an instrumentality for separating molded candy from starch. In view of the considerable number of candy factories in Minnesota, this possibility for the employment of blind persons should receive especial attention.

Another line of industry in which possibilities were found was the coffee packing companies. Eight processes were found to be practicable. The most interesting of these is the operation of the vacuum sealing machines for sealing cans of coffee, a machine which is just now coming into use. The machines seal eighteen

cans per minute. The blind demonstrator in his first hour's work attained a speed of twelve cans per minute. It was the belief of the superintendent that this operation would be an excellent one for a blind person and that he could reach the same productivity as a sighted person.

Cigar manufacture has also been mentioned as offering possibilities for blind workers but on investigation it was found that only one process of this kind was feasible. This is the process known as "stripping" and consists of pulling the main stem from a leaf of tobacco. This is usually paid on a time basis.

In the wholesale hardware establishments a prolonged test was made and six processes were found to be quite feasible. Some of these were rather unexpected, such as drilling metal castings with a power drill. In some of them also, the time element may prove insurmountable to some blind persons as it is naturally desired that the speed of production shall be the same as that of a sighted worker. Wrapping and sealing packages of burrs, however, proved to be an entirely successful thing and should prove to be an opportunity for the employment of the blind.

Two practicable processes were found in the plants of the bed manufacturers. The most hopeful of these consists of sanding bed ends. The demonstrator in the first lot attacked by him attained a speed of an average worker. The foreman was convinced that a blind person could do this work as well as a sighted person.

The flour mills proved to have only two processes which were at all possible for blind persons. Neither of these two was in the milling part of the work but related solely to the packages and sacks. The report of one of the foremen is interesting: "On the operation of turning bags a blind person could be employed profitably, on other operations not. Mr. Stackpole accomplished in his two day's visit at the bag factory an average day's work. With more practice he could have done better. The writer recommends therefore that in the event we increase our working force he would be more than glad to use a blind

girl in the capacity of bag turner." The work mentioned by the foreman is team work, requiring two operators to a team. Wages of \$2.50 per day are guaranteed and if the production exceeds 2500 bags a bonus is paid of 3¢ per 100.

Three processes were found in connection with linen supply companies. The most important of these consists of inserting grommets in towels. (Grommets are metal rings for sliding on rods. A foot machine is used.)

In the food manufacturing companies of which several were surveyed, seven processes were found to present opportunities for blind persons. Some of these, such as nesting and packing samples of creamettes, are short time jobs and could not be relied upon for full employment for any one person. Taping cartons and packing tin cans in cardboard containers appeared to be the most promising of the processes.

As a summary, therefore, it may be said that the research was continued far enough to prove that a considerable number of factory occupations exist which could be performed by blind persons. Either further study in times of greater industrial activity or the constant every day efforts of agencies interested in the blind should reveal more and more of such opportunities and bring about more and more placements of blind persons in this field. Along with and following any such efforts will undoubtedly need to be a prolonged publicity effort to acquaint employers with the possibilities to be found in blind workers and convince them that it is better economically for the state to utilize handicapped persons in such a productive manner than to discard them and eventually force them upon grants of public or private relief. At the same time that efforts are made to place such a program of factory employment for the blind before employers, attention should be given to preparing the blind to avail themselves of these openings. In most of the processes that have been listed school or institutional training would avail very little. The necessary skill must be attained on the job. However, there undoubtedly are alterations in the plan of education of the blind which could be made to prepare them better for factory life and factory workers' mode of livelihood. Entry into such varied fields as have been described would tend to bring the blind more into contact with the normal

population and decrease the tendency to make of them a segregated and peculiar fraction, which exists now partially because of the few occupations open to them.

The following is a detailed classification of the various industries and processes in which opportunities were found.

I. Small Machine Parts Shops.

Putting contact screws in cam.

Putting attachments on a one-day clock.

(Alarm winder,
alarm stop,
key holder,
key.)

Shaping of brass rivets.

Shaping discs.

(Done mostly by power punch machine.)

Punching holes in strips of thermo metal.

(Machine run by foot power.)

Pressing collars onto shafts.

(Using Arbor Press - hand machine.)

Riveting stubs into discs for contact springs.

Reaming holes in motor parts, using power drill.

Assembling small parts of thermostat

(i.e. cranks, contacts for spring motors,
cams, electric motor fronts, bases for spring
motors, binding posts, winding cables, fasten-
ing insulating links on fibre; this was done by
a blind man for 15 months.)

Assembling small parts of electric motors.

Assembling small die stamp parts in spring motors.

Measuring and winding covered wire cables.

Fastening insulating links on metal chains.

Testing stamped and drilled parts with gauge.

Putting set screws in binder post.

Assembling pitman on crank.

Unloading trucks.

Filling bins with standard parts.

Unpacking crated articles.

II. Paper box factories.

Bending boxes.

Taking off creased sheets at back end of creasing and slitting machine.

Piling up sheets on truck, making uniform stack of them.

Setting together racks of nests used for separating glass bottles when shipped in corrugated paper boxes.

Bundling boxes.

(Consisted of counting a stack up to fifteen and then tying them together with a cord so as to be easily loaded in cars.)

III. Knitting Works.

Taping of garments - hand operation.

Forming garments.

Hand taping buttons.

Machine taping buttons.

In Shipping department.

Setting up and nailing wooden packing cases.

Packing order in wooden cases, filling vacant spaces with waste paper.

Close cover and nail at each end.

Picking up wires which wrap around boxes, twisting them with twisting tool until they break off, thus securely fastening the boxes.

Packing pasteboard cases. Packing similar to that of wooden cases but sealing done with tape, also iron band drawn around carton and cut with iron shears. Seal placed on band.

IV. Automobile body building and repair shops.

Putting nuts and gaskets on gas line.

Assembling top rests.

Cementing boxes.

Putting screw tops on cans or capping.

Packing cans in cartons.

Putting separators into battery groups.

(Separators made either of rubber or wood.)

V. Novelty Advertising Companies.

Pasting backing on picture frames.

Cleaning glass in framing department.

Sanding picture moulding by hand.

Setting up pasteboard cartons in Shipping Dept.

- VI. Electric Light Globe Factory.
Etching bulbs.
- VII. Wooden box factories.
Assembling knocked down crates and boxes.
Stringing folding wooden boxes such as grocers' delivery boxes. (Process consists of stringing drilled slats on a wire frame.)
- VIII. Paper and cloth bag manufacturers.
Turning bags by hand.
Bag turning (large cloth bags.)
Piling and counting bags.
- IX. Manufacturers of Clocks and Chimes.
Assembling terminal blocks.
Re-tapping cores.
Affixing 2 magnetic coils by 2 bolts to the casting.
Affixing 2 small terminal blocks by 2 screws each to casting
Smoothing edge of soft iron pieces used for armature for chime hammer.
Smoothing edges of fibre strip
- X. Manufacturers of Candies.
Stacking of peanut bars on trays, three high
Feeding machine.
(This machine separates molded candy from starch)
Wrapping and packing candy in boxes.
Packing fudge in boxes.
Feeding dipping machine (enrouber)
(Operation consists of placing molded candy on traveling canvas belt.)
Taking candy from cooling machine and packing either on trays or in boxes.
- XI. Coffee Companies.
Packing coffee in boxes, using automatic weighing machine.
Packing cartons with paper packages, cardboard packages and pails. (Each carton contains a given number of the same package.)
Folding ends of wrappers for packages of coffee and sealing with tape.
Making cartons.
Packing wooden boxes with pails of coffee.
Sealing cartons
Operating sealing machine (sealing cans)
Making wooden boxes.

XII. Cigar Manufacturers.

Stripping

(Consists of pulling main stem from leaf of tobacco)

XIII. Wholesale hardware companies.

Drilling metal castings with power drill.

(Drilled with jig)

Drilling without jig, or enlarging holes.

Assembling ranges.

Drilling and tapping door castings.

Rivetting stove range top.

Wrapping and sealing packages of burrs.

XIV. Bed Manufacturing.

Making webs for bed springs.

Sanding bed ends.

XV. Flour Mills.

Folding and typing paper packages of flour.

Sewing jute sacks of feed by hand.

XVI. Linen Supply Company.

Punching holes in towels for grommets.

Inserting grommets in towels - foot machine.

(Grommets are metal rings for sliding on rods.)

Shaking towels preparatory to mangling.

XVII. Food Manufacturing Companies.

Packing samples of creamettes.

Nesting.

Taping cartons

Making barrels

Packing tin cans in cardboard containers.

Loading weighing machine.

Folding paper.

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for factory employment of the blind
in Minnesota.

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